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## (54) Anti-vibration holding element

(57) Anti-vibration holding element 1 comprises a securing part 3 that is mounted on a body 49 and a pipe holding part 2 that is connected to securing part 3, an anti-vibration member 5 being provided between the securing part and pipe holding part. Securing part 3 and pipe holding part 2 are separately formed; pipe holding part 2 is provided with a base 12 connected to securing part 3; on the base there is formed an accommodating part that receives the securing part; an anti-vibration member 5 is provided at the outer circumferential surface of securing part 3. When securing part 3 is accommodated in the base of the pipe holding part, this anti-vibration member connects the securing part and holding part simply by the anti-vibration member 5 fitting on to this base.

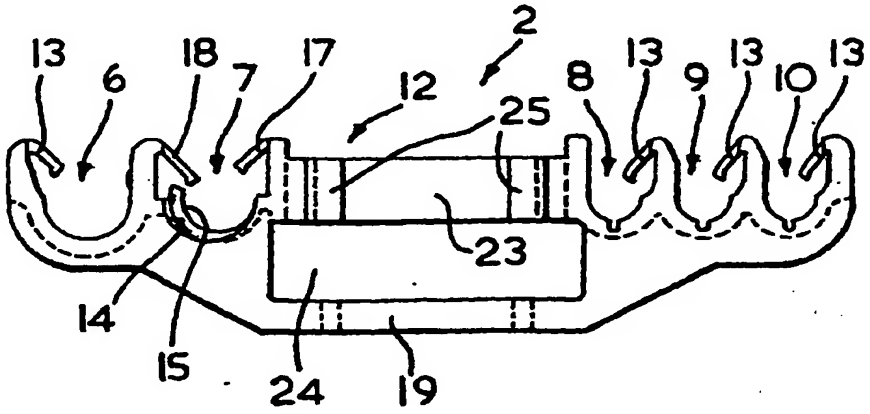


FIG. 2

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## Description

**[0001]** The invention relates to an anti-vibration holding element that is used to mount mounting members such as fuel pipes or brake pipes on to the body of a vehicle or the like, provided with anti-vibration means such that vibration from the mounted member is not transmitted to the body or vibration from the body is not transmitted to the mounted member.

**[0002]** Holding elements made of synthetic resin are known whereby a mounted member such as a fuel pipe or brake pipe is held on an automobile body. In such holding elements, anti-vibration holding elements are known in which an anti-vibration member is provided made of vibration-absorbing material, such that vibration coming from the fuel pipe or brake pipe is not transmitted to the body. For example, Japanese Utility Model Publication No. H.1-121782 discloses an anti-vibration holding element whereby a pipe is mounted on a body by linking a securing part and a pipe holding part by insertion of anti-vibration material between a securing part fixed to the body and a pipe holding part that holds the pipe. This anti-vibration holding element maintains quietness within the vehicle chamber since vibration generated by the pipe is not transmitted to the body.

**[0003]** In order to fix the securing part of the anti-vibration holding element to the body, the claw of a foot of the securing part was pushed into a mounting hole of the body, passing through the mounting hole of the body, and mounting was effected by means of the claw of the foot projecting at the inner side of the body and an anti-vibration rubber element at the outer side of the body, utilising the resilience of the anti-vibration rubber element. If the foot of the securing part is not pushed into the mounting hole of the body in a correct attitude (attitude normal to the body surface), the foot claw cannot pass through the mounting hole in a correct attitude, so mounting by means of the resilience of the rubber element cannot be achieved. For example, when pipe holding parts which are on both sides of a securing part are pushed in, a force in an inclined direction is applied to the securing part and this sometimes made correct mounting impossible. Also, when mounting, in a condition in which the leading end of the foot of the securing part was placed in a region where no mounting hole of the body was provided, if some part other than the securing part (for example the pipe holding part) was strongly pushed in, an opposing force was applied from the body to the leading end of the securing part; this sometimes caused the securing part to escape from the anti-vibration rubber element. Japanese Utility Model Publication No. H.5-73389 and Japanese Utility Model Publication No. H.4-75289 disclose anti-vibration holding elements wherein a pipe holding part comprising an anti-vibration member is joined to a securing part by fixing this securing part to the body using a securing element comprising a nut and bolt. With this anti-vibration holding element, mounting on the body is stable, but, since the pipe is held by the anti-vibration member, the pipe holding force is weak and a cover or the like is necessary in order to strengthen the holding force.

**[0004]** An object of the invention is therefore to provide an anti-vibration holding element wherein, whilst maintaining the anti-vibration function, a pipe can be securely held without requiring a cover, and wherein mounting on to the body can be performed in a simple and appropriate manner without requiring special skill.

**[0005]** According to an aspect of the invention, there is provided an anti-vibration holding element comprising a securing part mounted on a body by mounting means and a holding part that holds a member to be mounted on to the body by connection with this securing part, and provided with anti-vibration means that prevents transmission of vibration between the securing part and holding part:

wherein said securing part is formed separately from the holding part and is shaped to permit fitting into an accommodating portion of a base formed in the holding part, an anti-vibration member being provided at the periphery of this securing part at a portion that fits on to the base of the holding part, the anti-vibration member effecting connection of the securing part and holding part simply by the anti-vibration member fitting on to the base of the holding part.

**[0006]** As a more specific example of such an anti-vibration holding element, there is provided according to a second aspect of the present invention an anti-vibration holding element for pipe holding comprising a securing part that is mounted on a body by mounting means when pushed on to the body, and a pipe holding part having pipe holding means that holds a pipe and is connected to the securing part, and is provided with an anti-vibration means that prevent transmission of vibration between the securing part and pipe holding part;

wherein said securing part and said pipe holding part are separately formed, said pipe holding part comprises said pipe holding means and a base connected to the securing part, an accommodating portion whereby the securing part is received is formed in said base, an anti-vibration member is provided on the circumferential surface of said securing part, and, when the securing part is accommodated in said base of the pipe holding part, said anti-vibration member connects the securing part and holding part by said anti-vibration member fitting into the base.

**[0007]** As described above, the securing part is mounted in a simple and suitable manner simply by pressing on to the body, the strength of the mounting of the securing part on to the body is maintained at a high level, and the anti-vibration member whereby the pipe holding part is linked prevents the securing part from coming into direct engagement with the pipe holding part, so the basic anti-vibration function is maintained at a high level and furthermore the pipe is held by a hard pipe holding part rather than a soft anti-vibration material, so it is held in a stable and firm manner. The mount-

ing strength of the securing part is therefore high and there is no possibility of the mounting becoming detached.

**[0008]** With the anti-vibration holding element set out in the second aspect, the accommodating portion of the base of the pipe holding part is formed in a shape such that the securing part fitted with an anti-vibration member is received by inserting and sliding in a direction at right angles to the direction of pushing-on of the securing part, and a withdrawal-preventing claw can be provided at the inlet of this base accommodating portion such as to prevent withdrawal of the securing part fitted with an anti-vibration member once this has been received; in this way, a securing part fitted with an anti-vibration member can be assembled in a simple manner on to a pipe holding part. Since this securing part is formed with flanges at both ends in the direction of pushing-on of the securing part, the anti-vibration member can be received and held between these two flanges; in this way, withdrawal of the anti-vibration member in the axial direction of the stud from the securing part is prevented and the securing part is reliably fixed. Preferably, a pair of insertion guides extending in the sliding direction of the securing part are formed at the base of the pipe holding part, insertion grooves matching these insertion guides being formed on the side faces of the anti-vibration member. In this way, the assembly operation is further facilitated and is performed reliably. The anti-vibration member may be mounted so that it can be removed from the securing part, or may be integrally joined to the supporting part. Also, if a rod-shaped stud erected on the body is employed as mounting means, the securing part may be formed with a stud receiving hole and an engagement claw that engages with a screw-thread groove or circumferential grooves of the stud. If a body hole is utilised as mounting means, a clip that is engaged by insertion into the body hole may be provided on the securing part.

**[0009]** Embodiments of the invention are described below with reference to the drawings.

[Fig. 1]
This is a plan view of a pipe holding part of an anti-vibration holding element according to a first embodiment of the invention.

[Fig. 2]
This is a front view of a pipe holding part according to Fig. 1.

[Fig. 3]
This is a bottom view of the pipe holding part of Fig. 1.

[Fig. 4]
This is a plan view of a securing part of an anti-vibration holding element according to the first embodiment of the invention.

[Fig. 5]
This is a front view of the securing part of Fig. 4.

[Fig. 6]
This is a bottom view of the securing part of Fig. 4.

[Fig. 7]
This is a cross-sectional view along the line A-A of the securing part of Fig. 5.

[Fig. 8]
This is a cross-sectional view along the line B-B of the securing part of Fig. 4.

[Fig. 9]
This is a plan view of an anti-vibration member of a first embodiment of the invention.

[Fig. 10]
This is a front view of the anti-vibration member of Fig. 9.

[Fig. 11]
This is a partial front view of an anti-vibration member showing a modification of the anti-vibration member.

[Fig. 12]
This is a perspective view showing the operation of mounting the anti-vibration member on to the securing part.

[Fig. 13]
This is a perspective view showing the condition after mounting the anti-vibration member on to the securing part.

[Fig. 14]
This is a diagram illustrating the operation of mounting a securing part fitted with an anti-vibration member on to a pipe holding part.

[Fig. 15]
This is a plan view after completion of assembly of an anti-vibration holding element according to the first embodiment of the invention.

[Fig. 16]
This is a front view showing how the anti-vibration holding element of Fig. 15 is mounted.

[Fig. 17]
This is a partial cross-sectional view showing how the anti-vibration holding element of the first

embodiment of the invention is engaged with a stud.

[Fig. 18]
This is a front view after completion of assembly of an anti-vibration holding element according to a second embodiment of the invention.

**[0010]** Fig. 1 to Fig. 17 illustrate an anti-vibration holding element (1) according to a first embodiment of the invention. Anti-vibration holding element (1) comprises a pipe holding part (2) shown in Fig. 1 to Fig. 3 and a securing part (3) shown in Fig. 4 to Fig. 8; securing part (3) is joined to pipe holding part (2 )by mounting a rubber anti-vibration member (5) shown in Fig. 9 to Fig. 11 on securing part (3). Anti-vibration member (5) is integrally assembled with securing part (3) as shown in Fig. 13 by assembling it on to the securing part (3) as shown in Fig. 12. Fig. 14 shows how a securing part (3) with anti-vibration member (5) attached is joined to pipe holding part (2) by inserting it into a receiving part at the base of the pipe holding part (2). Fig. 15 and Fig. 16 show an anti-vibration holding element (1) constituted by joining pipe holding part (2) and securing part (3) with anti-vibration member (5) attached. Fig. 17 shows how an anti-vibration element (1) engages a stud erected on the body. Pipe holding part (2) and securing part (3) are respectively made of hard plastics material in order to hold the pipe reliably and to effect rigid securing on to the body. Anti-vibration member (5) consists of material having the ability to absorb vibration; typically it consists of natural rubber material or synthetic rubber material, which are commonly used as vibration-absorbing materials. In the embodiment illustrated, the member to be mounted on to the body is a pipe, so the holding part for the member to be mounted is formed as a pipe holding part. However, in this invention, the member to be mounted is not restricted to being a pipe and any type of member to be mounted on to the body could be employed. The holding part for the member to be mounted can also be formed as required in conformity with the member to be mounted.

**[0011]** In Fig. 1 to Fig. 3, pipe holding part (2) comprises a plurality of pipe gripping parts (6), (7), (8), (9), (10) that, as required, accommodate and hold a pipe when a pipe is pushed in, and a base (12) that accommodates and holds securing part (3). Each of pipe-gripping parts (6), (8) to (10) is respectively provided with a withdrawal-preventing flap (13) that prevents withdrawal of a pipe once the pipe has been received. In the embodiment shown, one pipe-gripping part (7) is formed such that it can hold pipes of different diameters. This pipe-gripping part (7) is formed with a fixed receiving face (14) for receiving large-diameter pipes and a swingable receiving face (15) for receiving smaller-diameter pipes, and is provided with a withdrawal-preventing flap (17) that engages with larger-diameter pipes and another withdrawal-preventing flap (18) that engages with smaller-diameter pipes. As is clear from the bottom face view of Fig. 3, the bottom face in the region of swingable receiving face (15) is open, such that receiving face (15) can swing downwards in Fig. 2. Pipe-gripping part (7) can therefore hold pipes of different diameter.

**[0012]** Base 12 is formed as an accommodating part that accommodates securing part (3) in the middle of pipe holding part (2). In order to accommodate securing part (3), base (12) comprises, at the bottom face of pipe holding part (2), two pairs of frame elements (19), (19), (21), (21), forming integrally from the bottom face thereof a horizontal rectangular frame; at the upper face of pipe holding part (2), a pair of guides (22) that, from the upper face thereof; integrally form a frame whereof one side is open and which is horizontal and rectangular; and a guide frame element (23) that connects these guides; the portion outside these frame elements constitutes a space for an accommodation portion for receiving the securing portion. The frame elements (19), (21) on the underside of base (12) serve to ensure the rigidity of base (12). These frame elements, so long as they can accommodate securing part (3)and ensure rigidity whilst forming a space in such an accommodated securing part through which a stud can pass are not restricted to actual frame elements but could be of any desired shape, for example they could be formed by a plate-shaped body open in the middle. Also, in base (12), underside frame elements (19) and upper guide frame element (23) are separated by a length such as to form a space (24) that can accommodate the bottom of securing part (3).

**[0013]** Upper guide (22) and guide frame element (23) fit by sliding on to and hold securing part (3) (as will be described, more precisely, the securing part fitted with the anti-vibration member) and, as best shown in Fig. 1, form a frame which, in plan view, is rectangular with one side open. A space to receive securing part (3) is formed in the area enclosed by guides (22) and guide frame element (23) and the securing part (3) is accommodated in this space. The frame aperture that is formed by guides (22) and guide frame element (23) constitutes an inlet for the insertion of securing part (3); guide frame element (23), apart from ensuring rigidity of base (12), functions as a stop for securing part (3) which is slidably accommodated therein, so that securing part (3) is held located in an appropriate position. The pair of guides (22) have the function of joining securing part (3) to pipe holding part (2) by fitting into the guide grooves formed in the side faces of securing part (3) (more precisely, the anti-vibration member of the securing part fitted with the anti-vibration member). Withdrawal-preventing claws (25) for preventing withdrawal of a securing part once this has been accommodated are formed at the ends of guides (22) on the inlet side. As shown, these withdrawal-preventing claws (25) are formed as resilient claws that permit sliding of securing part (3) in the insertion direction, but prevent

withdrawal once this has been accommodated. In order to make it possible to remove securing part (3), the tips of withdrawal-preventing claws (25) project, and are such that they can be flexed outwards.

**[0014]** Details of the securing part (3) are shown in Fig. 4 to Fig. 8.

**[0015]** Securing part (3) is mounted on the body using a screw or a stud formed with a plurality of circumferential grooves erected on the body of a vehicle, for example. Securing part (3) is therefore provided with a stud-receiving hole (26) at its centre. As shown in Fig. 4 and Fig. 6, this stud receiving hole (26) is not formed as a hole of circular shape or square shape, but as a slot. The reason why it is thus formed as a slot is in order to make it possible to absorb any discrepancy arising if the pitch of a plurality of studs differs from the pitch of a plurality of holding elements on the pipe. In general, in the case of a pipe that extends in a prescribed design over the body, in order for the pipe to be fixed to respective studs provided at a prescribed plurality of locations on the body, anti-vibration holding elements (1) are fixed beforehand at prescribed intervals along the pipe, matching the positions of the studs; pipes are delivered with such anti-vibration holding elements fitted, ready for mounting on studs on the body. Thus, if the pitch of the studs differs from the pitch of the holding elements, if the stud-receiving holes of the holding elements are square, the studs do not coincide with the receiving holes of the holding elements and it is therefore difficult to engage the holding elements on the studs. By forming the stud-receiving holes as slots, such discrepancy of pitch of the studs can be absorbed.

**[0016]** The inlet surface of the stud-receiving hole of the securing part (3) is formed with a pair of engagement claws (27), (27) that engage threaded grooves or circumferential grooves of the stud. In this embodiment, a projection (29) that restricts movement of engagement claw (27) in the direction of the stud root even if an attempt is made to withdraw securing part (3) from the stud is provided at the upper end of engagement claw (27). Also, engagement claw (27) is formed with multiple steps so as to provide a large number of engagement faces with the stud. This is convenient in that, although force is not required to push on to the stud, a large withdrawal-preventing force is maintained. However, it is not essential for engagement claw (27) to be constructed as above and an engagement claw of any commonly used shape could be employed so long as it enables engagement by pushing on to the stud and prevents withdrawal. Preferably, as shown in Fig. 7, engagement claws (27) are formed in flat plate shape matching the slot of stud receiving hole (26); they can thereby engage the stud over a wide range, enabling discrepancy of stud pitch to be absorbed.

**[0017]** Anti-vibration member (5) is mounted on securing part (3) such that it is wrapped around its peripheral surface constituting its side face. At both ends (upper end and lower end) of securing part (3), seen in the direction of pushing-on to the body i.e. the direction going upwards in Fig. 5, there are formed respectively an upper flange (30) and lower flange (31) on securing part (3), in order to prevent anti-vibration member (5) mounted thereon from being detached in the direction of pushing-on to a stud erected on the body (vertical direction in Fig. 5), a space whereby anti-vibration member (5) is received and held being formed between upper flange (30) and lower flange (31). Thanks to these flanges (30) and (31), there is no possibility of anti-vibration member (5) coming off securing part (3) even if securing part (3) is subjected to force pushing it on to the stud or withdrawing securing part (3) from the stud. It should be noted that, as shown in Fig. 5 and Fig. 6, upper flange (30) is formed projecting further outwards in the left and right direction than lower flange (31). The length of this upper flange (30) is formed larger than the width of the aperture portion of space (24) (length in the left and right direction of Fig. 2) formed on the base (12) of pipe holding part (2), so that upper flange (30) cannot be inserted into space (24). Engagement claws (27) are provided on securing part (3) so that securing part (3) is fixed in direction with respect to the stud, in order to achieve engagement on to the stud. Thanks to the long upper flange (30), although securing part (3) fitted with anti-vibration member (5) can be inserted on to base (12) in a correctly oriented condition with upper flange 30 uppermost, in the downwardly-directed, incorrect condition, it cannot be joined with base (12) of pipe holding part (2). In this way, securing part (3) is mounted in the correct direction of pipe holding part (2) and the engagement claws (270 of securing part (3) are correctly engaged with respect to the pushing-on direction on to the stud. Lower flange (31) is formed shorter than the width of the aperture portion of space (24) of base (12) so that it can be received in space (24).

**[0018]** The axial part (33) of securing part (3) is formed by a pair of wall portions and another pair of supporting pillar portions, enclosing stud receiving hole (26); windows (34) for the formation of engaging claws (27) are formed at the side where the supporting pillar portions are provided. The height of axial part (33) and the size of its periphery in horizontal cross-section are determined so as to match the size of the space formed by guides (22) and guide frame element (23) of base frame (12) and the size of anti-vibration member (5) that surrounds the periphery of axial part (33). In other words, when securing part (3), surrounded by anti-vibration member (5), is inserted by sliding into the space formed by guides (22) and guide frame element (23) of base (12), it is made to be of a size whereby it is joined to pipe holding part (2). This size can be any desired dimension so long as securing part (3) fitted with anti-vibration member (5) is joined to base (12). Also, picking up of the tip of a stud erected on the body is facilitated by forming on upper flange (30) a recess (35) surrounding stud receiving hole (26) but larger than this. As a modification of recess (35), it is possible to

provide tapering from the entrance to the recess towards the stud receiving hole, the thickness in the height direction of flange (30) being made larger. This is convenient because, if the tip of the stud is picked up by the widely opened recess when anti-vibration holding element (1) that has been connected with securing part (3) is pushed on to the stud, the entire anti-vibration holding element (1) is guided during this pushing-on movement, such that the stud-receiving hole is guided on to the tip of the stud.

**[0019]** Details of anti-vibration member (5) are shown in Fig. 9 and Fig. 10. Anti-vibration member (5) is integrally formed of for example natural rubber or synthetic rubber which are commonly used as vibration-absorbing materials. Its size and shape are determined such that it has a height that can be accommodated in the space between upper flange (30) and lower flange (3)1 of securing part (3), and can surround axial part (33) of securing part (3), and such that it can fit into the space formed by guides (22) and guide frame element (23) of the base of pipe holding part (2). In this embodiment, it is formed by four sides (37) to (39) and (41) that form a rectangular shape, matching the space defined by guides (22) and guide frame element (23) and securing part (3). Of these sides, the three sides (37) to (39) are continuous but the other side (41) is severed in the middle. By means of this severed portion, side (41) can be opened out wider than axial part (33), enabling anti-vibration member (5) to be mounted on axial part (33) of securing part (3) in a simple manner, such as to surround it. On anti-vibration member (5), as shown in Fig. 10, on the outside portions of sides (37) to (39) there are formed grooves (42) that fit slidably on to guides (22) and guide frame element (23) of base (12) of pipe holding part (2). A groove (42) is also formed on side (41) so that withdrawal-preventing claws (25) that extend from guides (22) can fit into this groove (42). Thus anti-vibration member (5) is connected to base (12) by guides (22) and guide frame element (23) by means of these grooves (42). Since anti-vibration member (5) is mounted so as to surround the outer peripheral surface of axial part (33) of securing part (3), anti-vibration member (5) performs the function of mounting securing part 3 on base 12 of pipe holding part (2).

**[0020]** The size and shape of anti-vibration member (5) are determined by securing member (3) and base (12), but alteration of the shape may be performed to match for example the anti-vibration characteristic, for example the frequencies etc. of vibration that are to be absorbed. Fig. 11 shows a partial external view of an anti-vibration member having an anti-vibration characteristic different from that of anti-vibration member (5) shown in Fig. 9 and Fig. 10. In this way, several types of anti-vibration member of different anti-vibration characteristics may be prepared and an anti-vibration member matching the required anti-vibration characteristic may be used for mounting on to the securing part. Also, as another modification, anti-vibration member (5) may be integrally formed in the manufacturing of securing part (3); in this way, the time required for mounting the anti-vibration member on to the securing part can be eliminated.

**[0021]** Assembly and mounting of anti-vibration holding element (1) will now be described with reference to Fig. 12 to Fig. 17. In Fig. 12, side (41) of anti-vibration member (5) is opened out and, as shown by arrow (43), anti-vibration member (5) is mounted on to axial part (33) of securing part (3) so as to surround it. Fig. 13 shows anti-vibration member (5) integrally joined to securing part (3). As shown by the arrow (45) of Fig. 14, securing part (3) with anti-vibration member (5) mounted thereon is slidingly inserted in the direction at right angles to the direction of pushing-on securing part (3), into the space of base (12) of pipe holding part (2) that accommodates securing part (3).

**[0022]** In this insertion operation the pair of guides (22) of base (12) are lined up so that they can be inserted in the pair of grooves (42) formed on the side faces of anti-vibration member (5) of securing part (3) and securing part (3) is then directly slid on. When anti-vibration member (5) of securing part (3) reaches guide frame element (23), withdrawal is prevented by locking of withdrawal-preventing claws (25) in a condition in which securing part (3) fitted with anti-vibration member (5) is accommodated in base (12). In this condition, merely by fitting anti-vibration member (5) on to guides (22) and guide frame element (23) of base (12), anti-vibration member (5) connects securing part (3) and pipe holding part (2). Consequently, since there is no possibility of direct contact of securing part (3) with pipe holding part (2), vibration of pipe holding part (2) cannot be directly transmitted to securing part (3) and also vibration of securing part (3) cannot be directly transmitted to pipe holding part (2); thus vibration is reliably absorbed by the intervening anti-vibration member (5). Also, even when anti-vibration member (5) has no rigidity due to being made of rubber or the like, since this anti-vibration member (5) is mounted on securing part (3) of high rigidity, high rigidity of securing part (3) fitted with the anti-vibration member is maintained, and the connection strength of securing part (3) and pipe holding part (2) is maintained at a high level.

**[0023]** Fig. 15 shows the configuration when assembly as anti-vibration holding element (1) is completed by accommodating securing part (3) fitted with an anti-vibration member in base (12) of pipe holding part (2), and rigid connection of securing part (3) and pipe holding part (2) by means of anti-vibration member (5). As shown in Fig. 16, a plurality of pipes (46), (47) constituting members to be mounted are held by pushing on to pipe-gripping parts (6) to (10) of pipe holding part (2) in anti-vibration holding element (1). Pipes (46) and (47) are shown as having different diameters. Pipes (46) and (47) extend for a long distance and a plurality of anti-vibration holding elements (1) are mounted on these pipes (46), (47) at prescribed intervals. For example,

assembly of anti-vibration holding elements (1) on to the pipes is done by the pipe manufacturer and a set of pipes fitted with anti-vibration holding elements are delivered to an automobile manufacturer. As shown in Fig. 17, rod-shaped studs (50) formed with screw-threads (or a plurality of circumferential grooves) are erected at prescribed locations on body (49) such as the body of an automobile. By bringing in the set of pipes fitted with anti-vibration holding elements (1) up to these locations, they can be mounted at the prescribed locations on body (49) using studs (50).

**[0024]** By locating vibration preventing holding elements (1) mounted on the pipes in position such that the tips of studs (50) are picked up in the recesses (35) formed in upper flanges (30) of the securing parts (3), studs (50) are pressed on to body (49) such that studs (50) are received in the stud-receiving holes (26) of securing parts (3). In Fig. 17, anti-vibration holding element (1) is pressed upwards against body (49). By means of this pushing-on, engagement claws (27) of securing part (3) ascend while engaging the screw-threaded grooves of stud (50); when anti-vibration holding element (1) reaches the uppermost position, by the action of engagement claws (27), securing part (3), and hence anti-vibration holding element (1), are held in this position. It should be noted that although, when anti-vibration holding element (1) is raised, a force acts to prevent raising due to the pipe that is held by the pipe holding member (2), so that a force acts tending to withdraw anti-vibration member (5) downwards from securing part (3), due to the provision of lower flange (31) on securing part (3), anti-vibration member (5) cannot be withdrawn from securing part (3). Also, when adjusting the pipe position after pipe mounting, even if the pipe is directly carried, there is no possibility of the pipe becoming detached or of the connection with the securing part being detached. Furthermore, in this case, when pushing pipe holding part (2) towards the body, even if a force acts tending to release connection with the securing part (3) through anti-vibration member (5), thanks to the provision of upper flange (30) on securing part (3), there is no possibility of anti-vibration member (5) being detached from securing part (3). Consequently, anti-vibration holding element (1) exhibits the anti-vibration function in a reliable manner and furthermore can effect connection of the member to be mounted (pipe) to the body in a reliable and firm manner.

**[0025]** Fig. 18 illustrates an anti-vibration holding element (52) according to a second embodiment. Although this anti-vibration holding element (52) is of practically the same construction as the anti-vibration element (1) of the first embodiment, it differs in that on upper flange (30) of securing part (53) a clip (54) is provided that is engaged by insertion into a hole provided in the body. Seen from above in Fig. 18, this clip (54) is formed in the shape of a rod of practically square shape, being formed with a resilient engagement claw (56) that extends outwards in inclined fashion from the middle there of to a position adjacent flange (30). Thanks to clip (54), the labour of mounting on a stud or the like is eliminated simply by forming a mounting hole in the body.

**[0026]** With this invention, the securing part is mounted in a simple and correct fashion on the body merely by pressing on to the body, the strength of the connection of the holding part of the member to be mounted and the securing part is maintained at a high level by an anti-vibration member, the mounting strength of the anti-vibration holding element on to the body is maintained at a high level, and there is no possibility of the anti-vibration material that connects the pipe holding part directly engaging the pipe holding part, so the basic anti-vibration function is maintained at a high level and furthermore the mounting member can be held by a hard holding part rather than a soft anti-vibration member, so it can be held in a stable and firm manner, the strength of mounting of the securing part is high, and there is no possibility of the mounting becoming detached.

## Claims

1. Anti-vibration holding element comprising a securing part mounted on a body by mounting means and a holding part that holds a member to be mounted on to the body by connection with this securing part, and provided with anti-vibration means that prevents transmission of vibration between the securing part and holding part;

   wherein said securing part is formed separately from said holding part and is shaped to permit fitting into an accommodating portion of a base formed in the holding part, an anti-vibration member being provided at the periphery of this securing part at a portion that fits on to the base of said holding part, the anti-vibration member effecting connection of the securing part and holding part by the anti-vibration member fitting on to the base of said holding part.

2. Anti-vibration holding element for pipe holding comprising a securing part that is mounted on a body by mounting means when pushed on to the body, and a pipe holding part having pipe holding means that holds a pipe and is connected to said securing part, and is provided with an anti-vibration means that prevent transmission of vibration between the securing part and pipe holding part;

   wherein said securing part and said pipe holding part are separately formed, said pipe holding part comprises said pipe holding means and a base connected to the securing part, an accommodating portion whereby the securing part is received is formed in said base, an anti-vibration member is provided on the circumferential surface of said securing part, and, when the securing part is

accommodated in said base of the pipe holding part, said anti-vibration member connects the securing part and holding part by said anti-vibration member fitting into the base.

3. Anti-vibration holding element according to claim 2 wherein the accommodating portion of the base of said pipe holding part is formed in a shape whereby the securing part fitted with the anti-vibration member is received by inserting and sliding in a direction at right angles to the direction of pushing-on of this securing part, and a withdrawal-preventing claw is provided at the inlet of this base accommodating portion such as to prevent withdrawal of the securing part fitted with the anti-vibration member, once this is received.

4. Anti-vibration holding element according to claim 3 wherein the securing part is formed with respective flanges at both ends in the direction of pushing-on, said anti-vibration member being received between these two flanges.

5. Anti-vibration holding element according to claim 4 wherein, in the base of said pipe holding part, there are formed a pair of insertion guides extending in said sliding direction, insertion grooves matching these insertion guides being formed in the side faces of said anti-vibration member.

6. Anti-vibration holding element according to any of claims 2 to 5 wherein the anti-vibration member is formed separately from the securing part and is removably mounted on this securing part.

7. Anti-vibration holding element according to any of claims 2 to 5 wherein the anti-vibration member is integrally formed such as to surround the periphery of the securing part.

8. Anti-vibration holding element according to any of claims 2 to 7 wherein said mounting means comprises a rod-shaped stud formed with a screw-thread or a plurality of circumferential grooves erected on the body and an engagement claw that engages a stud-receiving hole formed in the securing part and the threaded groove or circumferential grooves of the stud.

9. Anti-vibration holding element according to any of claims 2 to 7 wherein said mounting means is a clip that is engaged by insertion into a hole provided on the body, this clip being provided on the securing part.

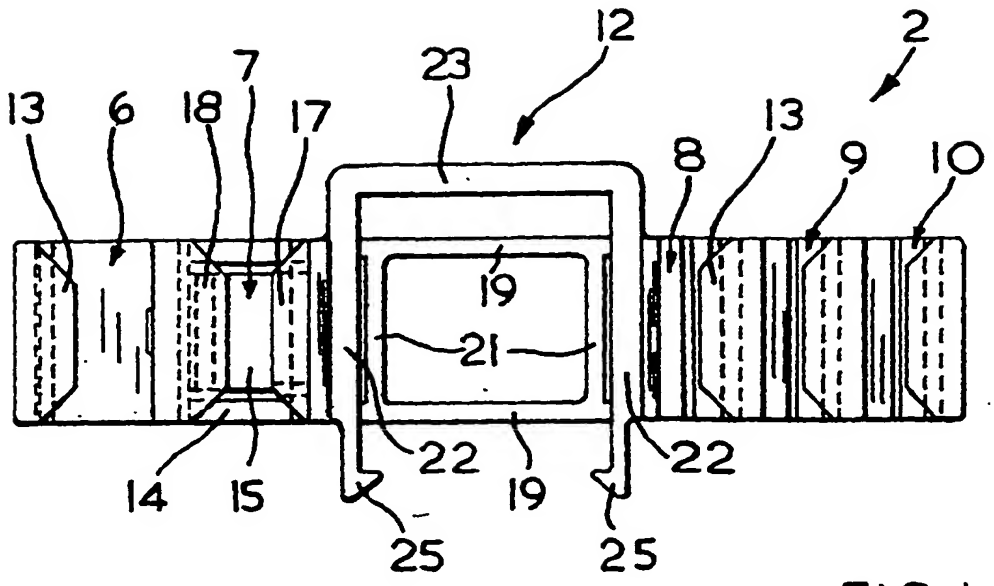


FIG. 1

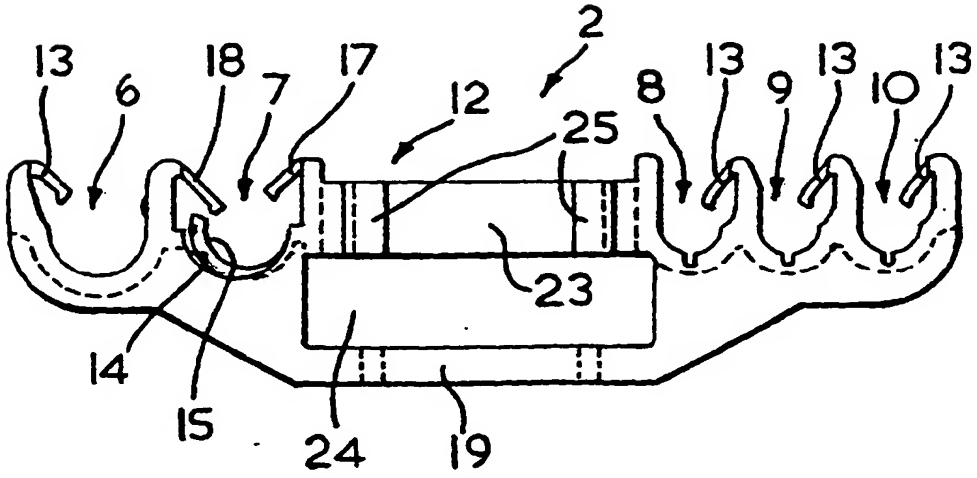


FIG. 2

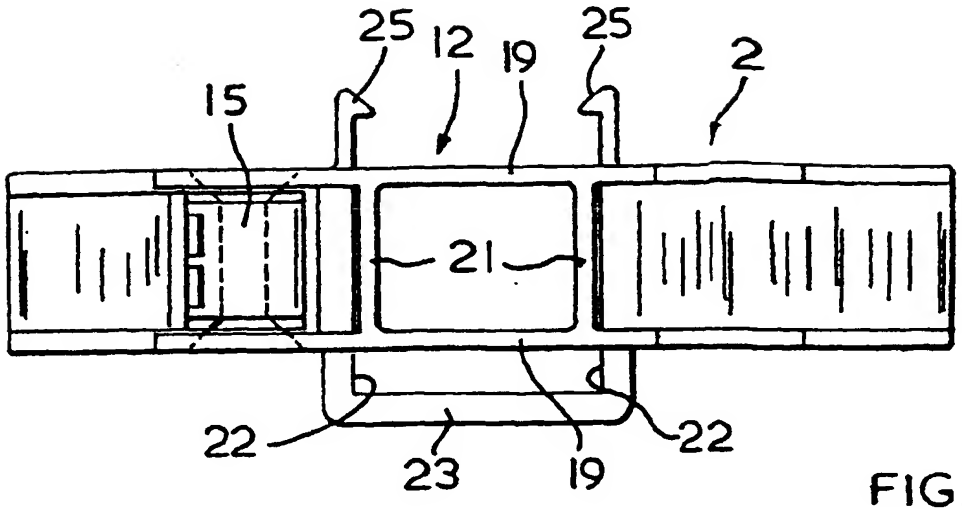


FIG. 3

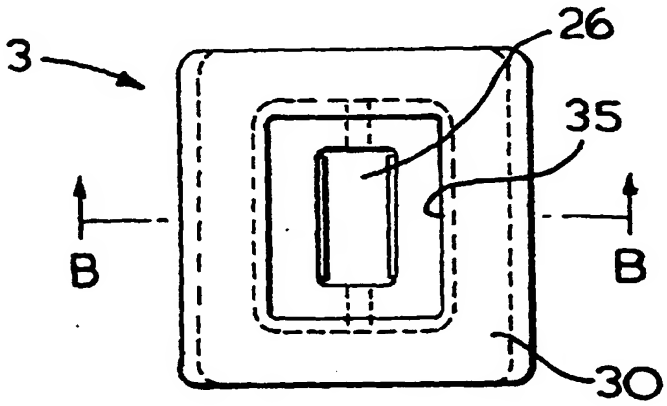


FIG. 4

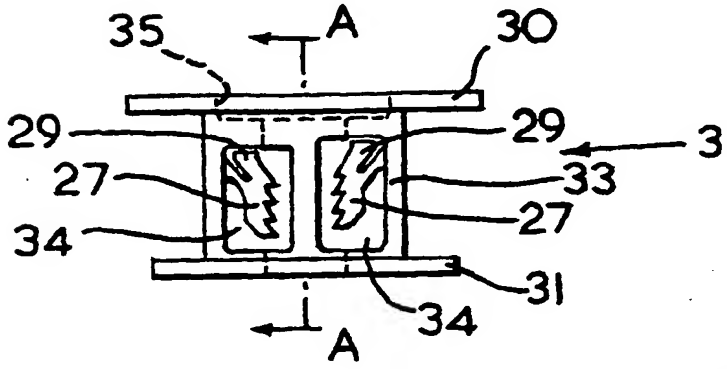


FIG. 5

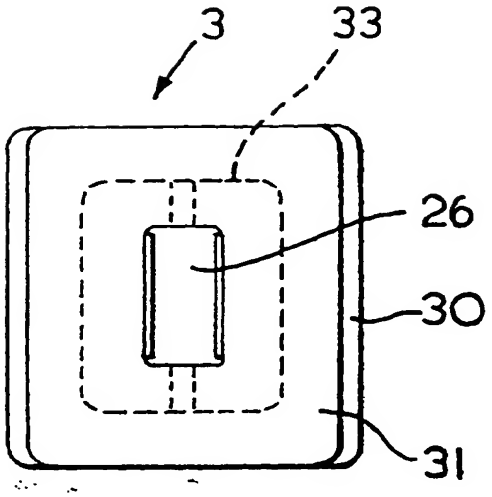


FIG. 6

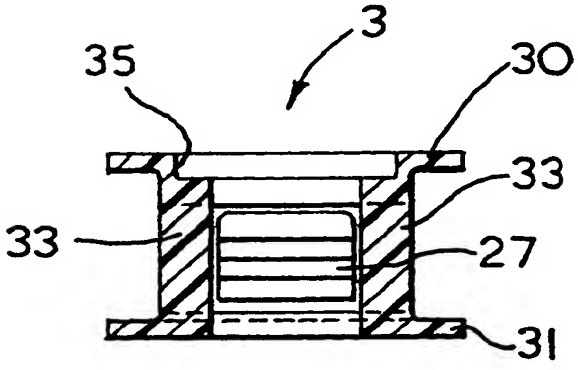


FIG. 7

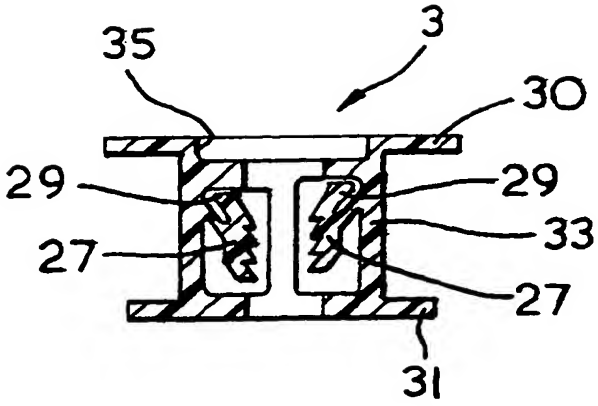


FIG. 8

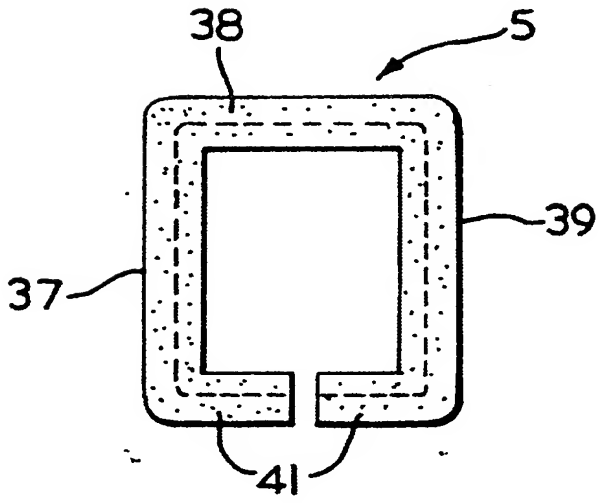


FIG. 9

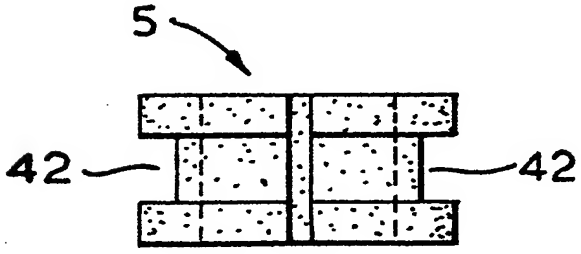


FIG. 10

FIG. 11

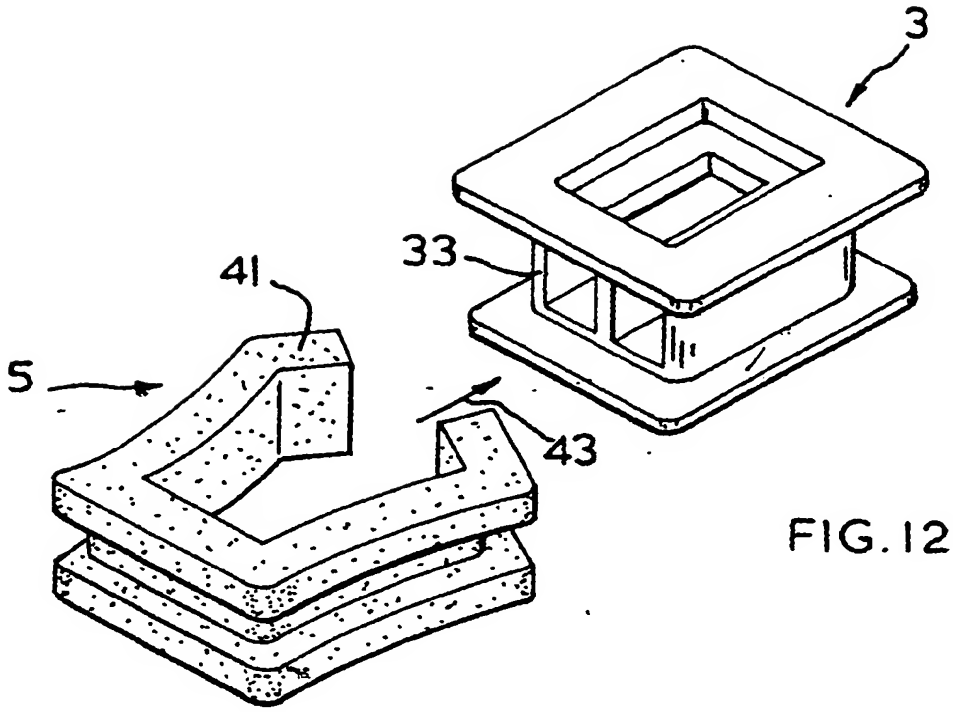


FIG. 12

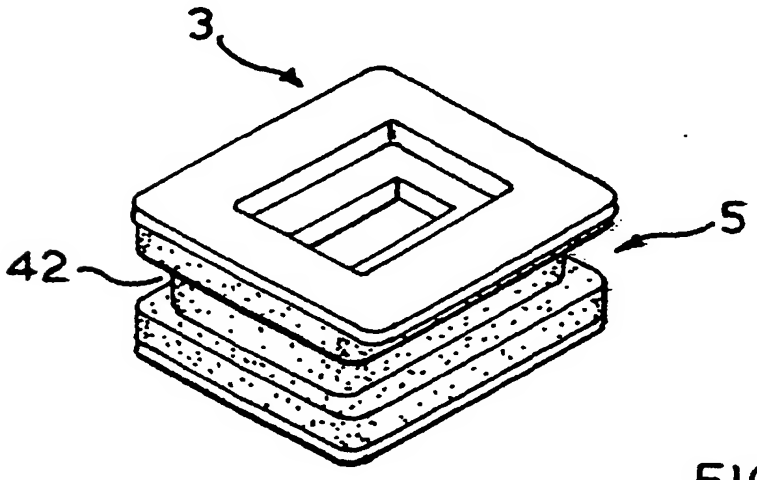


FIG. 13

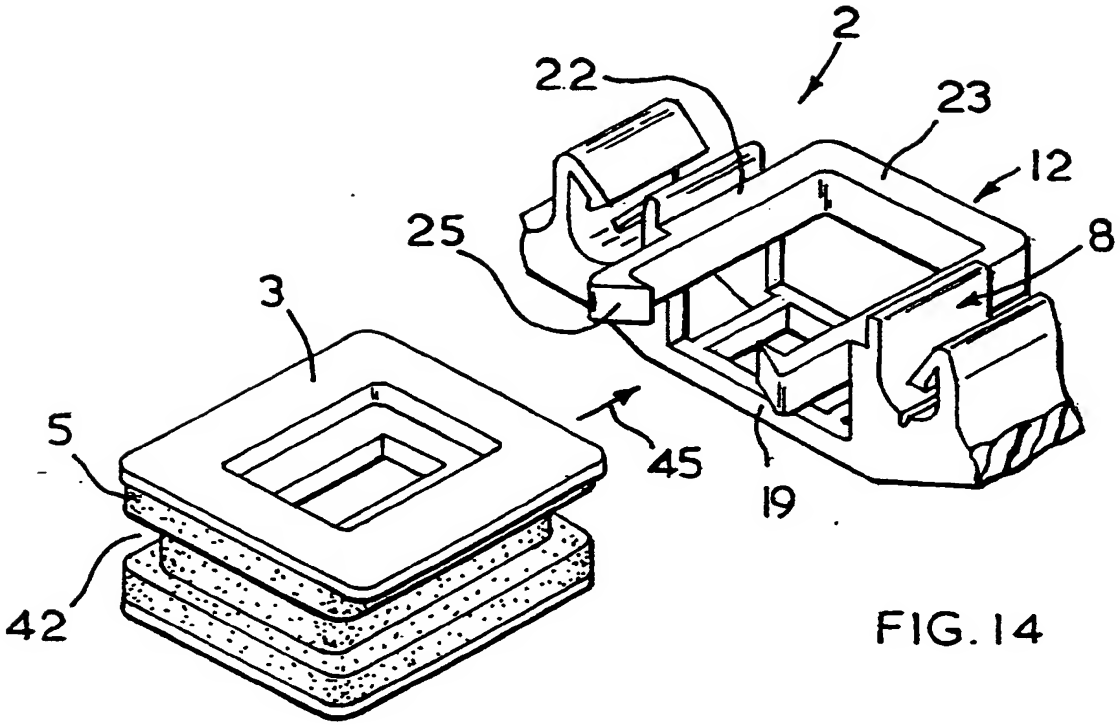


FIG. 14

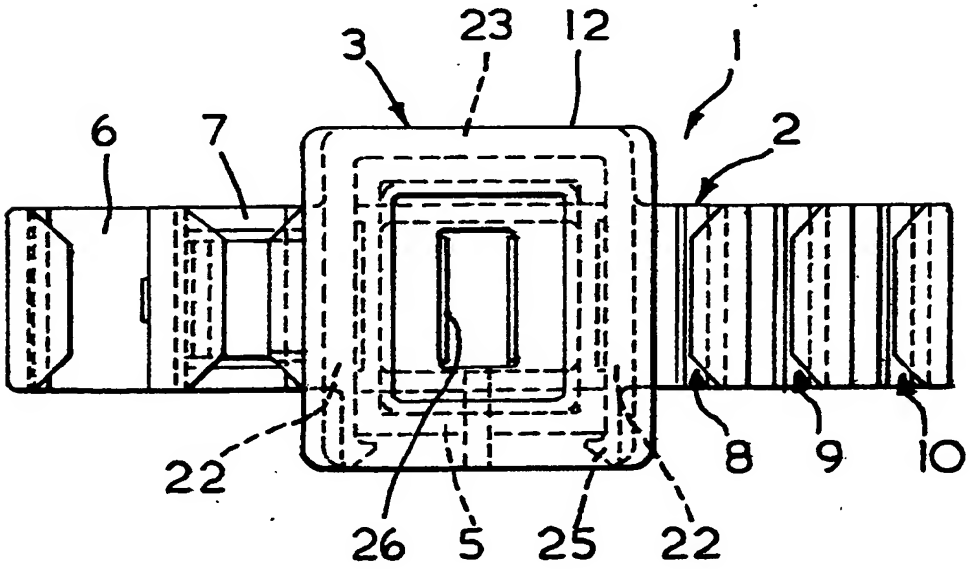


FIG. 15

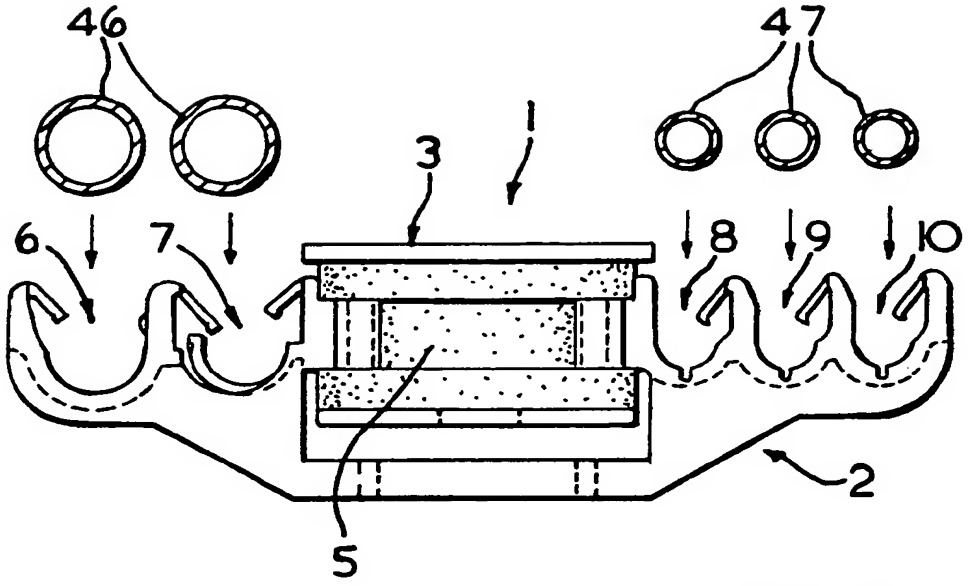


FIG. 16

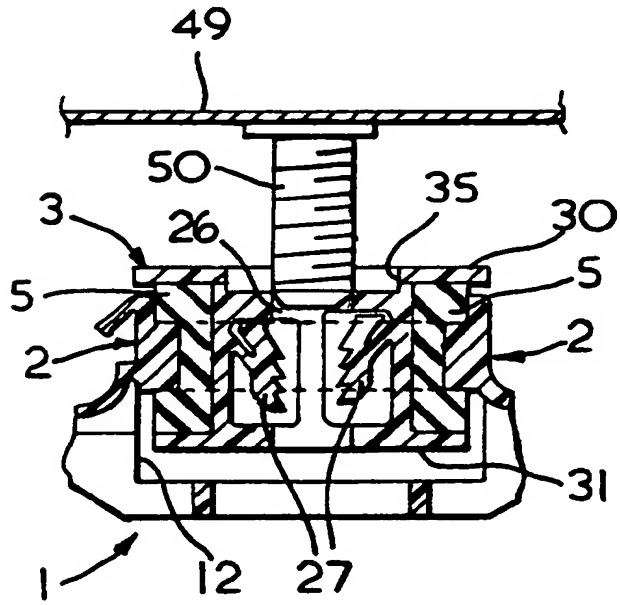


FIG. 17

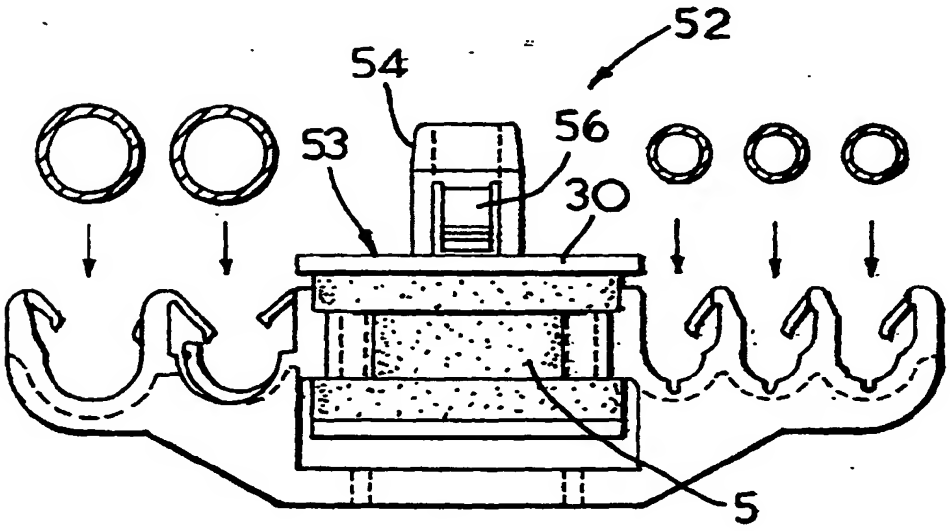


FIG. 18